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February 19, 2014

Mark Conrad
Assistant United States Attorney
United States Attorney's Office
450 Golden Gate Ave., Box 36055
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RE: *Hesterberg v. United States*, Case No. C 13-01265 JSC

Dear Mr. Conrad:

At your request, below is a written summary of my opinions regarding the above named case. My opinions are based on my training, experience and research as a Professor of Emergency Medicine in the Department of Emergency Medicine at the University of California San Diego School of Medicine and Health System. I have conducted numerous human research studies on the topic of restraint physiology and less lethal weapons, including the Taser, that have been published in peer-reviewed medical journals and presented at national medical meetings and scientific assemblies. I am also a practicing emergency physician, board-certified in the specialty of Emergency Medicine, and a Fellow of the American College of Emergency Physicians and American Academy of Emergency Medicine.

In formulating my opinions regarding the specific issues of this case, I have relied upon my own scientific and clinical research on the Taser, a review of the current medical and scientific literature relevant to this case, and the specific materials you forwarded me regarding the above named case, including the Complaint for Damages and Jury Demand and the transcripts of the depositions of Gary Hesterberg and Sarah Cavallaro, as well as the exhibits to those deposition transcripts. Except as noted, my opinions and testimony will be to a reasonable degree of medical certainty. If additional pertinent information is revealed and provided to me subsequent to this letter, my opinions may change.

A summary of the facts relevant to my opinions is as follows: On January 29, 2012, Gary Hesterberg, at that time a middle-aged man with a history of hypertension and atrial fibrillation, was detained by National Park Service Ranger Sarah Cavallaro. During the incident, Ranger Cavallaro deployed a Taser device on Mr. Hesterberg with barbs penetrating his back and buttock and activated for a 5-second cycle. Mr. Hesterberg subsequently fell to the ground and sustained abrasions to his extremities. San Mateo County Sheriff's deputies arrived shortly thereafter and handcuffed Mr. Hesterberg in the prone position. Ranger Cavallaro removed the Taser barbs from his back.

Paramedics then arrived on the scene to evaluate Mr. Hesterberg. Per their records, Mr. Hesterberg complained of left shoulder pain and was noted to have an elevated pulse and

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blood pressure, and an abrasion to his right elbow. The paramedics provided basic wound care to Mr. Hesterberg, after which he reportedly refused transport to a hospital. He did not seek any further medical or psychiatric treatment related to or as a result of the incident.

By way of background, the Taser is a handheld law enforcement weapon that falls in the category of a conductive energy device (CED). The Taser delivers a high-voltage, low frequency electrical impulse via either probe or drive-stun mode. In the probe mode, the weapon fires barbs at a subject and delivers an electrical impulse across those barbs after making contact. This impulse results in a transient neuromuscular incapacitation to the subject, as well as the sensation of pain. In the drive-stun mode, the electrical impulse is delivered by direct contact of the weapon on the subject, as opposed to barbs, and delivers a painful stimulus, with less or no neuromuscular incapacitation.

Numerous studies have now been conducted to evaluate the physiologic effects and safety of the Taser device. My research group has conducted a number of these studies which have found no evidence of electrocardiographic changes, cardiac or heart injuries, respiratory compromise, or significant metabolic disturbances associated with the device.¹²³⁴⁵⁶ Moreover, our findings have been replicated by other investigators who have also demonstrated no significant inherently deleterious physiologic effects in human subjects under laboratory testing or the field setting.⁷⁸⁹¹⁰ These findings, as well as the work of other researchers, formed the basis, in part, for a May 2011 report by the U.S. Department of Justice, which concluded that there was “no conclusive medical evidence in the current body of research literature that indicates a high risk of serious injury or death to humans from the direct or indirect cardiovascular or metabolic effects of short-term CED exposure in healthy, normal, nonstressed, nonintoxicated persons,” that “current research does not support a substantially increased risk of cardiac arrhythmia in field situations, even if the CED darts strike the front of the chest,” and that law enforcement “need not refrain from using CEDs to place uncooperative or combative subjects in custody, provided the devices are used in accordance with accepted national guidelines and appropriate use-of-force policy.”¹¹

Much of the unwarranted concern of electrocution is based on a lay misunderstanding of the Taser device. While the voltage of the device may be considered high, the actual amperage or delivered charge is quite low (1.9 milliamperes). The stored energy in the Taser X26 device is about 0.36 joules per pulse, which is much lower than the energy delivered by an automatic external cardiac defibrillator often used by paramedics (360 joules). For that matter, it is also a small fraction of the amperage delivered via standard household electrical outlets. It is not the delivered charge but rather the rapid cycling of the Taser that causes actual muscle contraction (at about 19 times per second) when the device is deployed. Once the energy from the device is turned off, its effects and the pain and incapacitation of the subject ends.

Injuries have been reported with use of the Taser. These include skin, soft tissue, and musculoskeletal injuries from falls caused by incapacitation or sudden muscular

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contraction, as well as penetrating injuries from the Taser barbs themselves. In Mr. Hesterberg's case, he did appear to sustain some minor traumatic injuries as a result of falling after the Taser deployment, for which he received care from the medics, did not seek any further medical care, and appears to have recovered from uneventfully.

Mr. Hesterberg also had a history of hypertension and possibly paroxysmal atrial fibrillation. These conditions would not put him in any additional risk with the Taser deployment. In fact, studies indicate that the Taser causes similar or less physiologic stress than mild to moderate levels of exertion.¹² In Mr. Hesterberg's case, he was already exerting himself on a run prior to the incident and he does not appear to have suffered any detrimental cardiac or hemodynamic impact from the Taser deployment.

There is no question that, because the device operated as intended, Mr. Hesterberg experienced pain and neuromuscular incapacitation as a result of the use of the Taser. Having been subjected to a 5-second Taser deployment myself as part of our research studies, I can attest to the fact that the sensation is painful and incapacitating. However, as soon as the cycle was completed, the painful stimuli ended and I had full control of my body movement and musculature. Throughout the deployment and afterward, I was fully conscious and cognizant.

In accordance with the Rules of Civil Procedure, my compensation for services rendered in association with this case are \$500/hour, including travel time and expenses. Prior cases in which I have provided testimony over the past four years are: Chavez v. City of Los Angeles, 2008; Medina v. City of Los Angeles, 2008; McCullaugh v. Summit County, et al., Ohio, 2009; Marquez v. City of Phoenix, Arizona, 2009; La Blanc v. City of Los Angeles, et al., 2010; Martin v. Broadview Heights, Ohio, 2010; Petrisor v. City of Bellevue, Washington, 2011; Gabales v. County of San Joaquin, 2011; Burdine v Kaiser, Ohio, 2011; Smith v. Minneapolis, 2013.

Should you have any further questions, please do not hesitate to contact me at any time.

Sincerely,



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